IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of :	Pierre Fayet et al.	Confirmation No. 4554
Serial No.: 10/529,533		Group Art Unit: 1792
Filed: April 19, 2005		Examiner: Keath T. Chen
Title: DEVICE FOR THE TREATMENT OF A WEB-TYPE MATERIAL IN A PLASMA-ASSISTED PROCESS		
Atty. Dkt.: FRR-16006		

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPELLANTS' BRIEF (37 CFR § 41.37)

Applicant is submitting an Appellants Brief. Authorization for payment to cover the fee referenced in 37 CFR 41.20(b)(2) is provided. If any additional fees are due in combination with this filing, please charge such additional required fees to our Deposit Account No. 18-0160, our Order No. FRR-16006.

This brief contains the items under the following headings in the order set forth below:

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I. REAL PARTY IN INTEREST

Tetra Laval Holdings & Finance S.A., having a place of business at 70 Avenue General Guisan, Pully, Switzerland CH-1009 is the real party in interest and the assignee of all right, title, and interest to the invention throughout the world. An assignment from inventors Pierre Fayet and Bertrand Jaccoud has been recorded with the United States Patent and Trademark Office and can be found at Reel 016051 and Frame 0547.

II. RELATED APPEALS AND INTERFERENCES

Applicant does not know of any related appeals and/or interferences that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

Seven claims are currently pending in this application.

B. Status of the Claims

1. Claims previously canceled: Claims 2-6.
2. Claims withdrawn from consideration but not cancelled: None.
3. Claims pending: Claims 1 and 7-12.
4. Claims allowed: None.
5. Claims rejected: Claims 1 and 7-12.
6. Claims objected to: None.
7. Claims indicated as allowable if the § 112 rejections are overcome: None.

C. Claims on Appeal

The claims on appeal are: Claims 1 and 7-12.

IV. STATUS OF AMENDMENTS

A Response to the Final Office Action of October 16, 2008 was filed on December 10, 2008. The Examiner, as noted in an Advisory Action of December 18, 2008, did not enter the proposed amendments for purposes of appeal. The Examiner maintained a rejection of Claims 1 and 7-12.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent Claim 1

A device for coating a web material in a single step plasma enhanced chemical vapor deposition process wherein the device includes a vacuum chamber equipped for maintaining a constant reduced pressure therein. *(Specification paragraph [0018]; Fig. 1)*

Within the vacuum chamber, the device includes a rotating drum for supporting and continuously transporting a web material lying against a circumferential surface of the drum, the drum being one of electrically grounded, electrically floating, and negatively biased. *(Specification paragraphs [0007], [0018]; Fig. 1)*

Also within the vacuum chamber are more than two independent, substantially identical, magnetron electrodes comprising rectangular magnetron faces with a length and a width, a center pole and a peripheral pole, the two poles having opposite polarities and the peripheral pole extending around the center pole. *(Specification paragraphs [0020], [0026]; Figs. 2 and 4)* Each magnetron electrode is powered with an alternating voltage by its own power supply unit. *(Specification paragraph [0020]; Fig. 2)* Also arranged within the vacuum chamber are a plurality of gas supply lines. *(Specification paragraphs [0008], [0018]; Fig. 1)*

The magnetron electrodes are arranged with the magnetron faces facing the circumferential surface of the drum and at a same distance therefrom, the lengths of the magnetron faces extending parallel to a drum axis and the widths of the magnetron faces extending substantially tangential to the circumferential surface. *(Specification paragraph [0020]; Fig. 2)*

The gas supply lines extend between neighboring magnetron electrodes and comprise rows of gas outlets arranged for gas injection substantially perpendicular to the circumferential drum surface, wherein the magnetron faces and the gas supply lines are arranged side by side to form, together with a part of the circumferential surface of the rotating drum, one baffle-free combined process space and wherein the gas supply lines are connected to a source of only one process gas mixture. *(Specification paragraphs [0018], [0021], [0026]; Fig. 2)*

Dependent Claim 8

The device according to independent claim 1, further comprising means for removing in an axial direction the gas supplied to the space between magnetron faces and the rotating drum. *(Specification paragraph [0021]; Fig. 2)*

VI. GROUNDS OF REJECTION TO BE REVIEW ON APPEAL

1. Whether claim 8 meets the written description requirement of 35 U.S.C. §112, first paragraph.

2. Whether claims 1 and 7-12 are patentable under 35 U.S.C. §103(a) over U.S. Patent No.5,879,519 to Seeser et al. in view of U.S. Patent No. 3,884,787 to Kuehnle and U.S. Patent 6,306,265 to Fu et al.

VII. ARGUMENTS

1. The Rejection of Claim 8 under 35 U.S.C. §112, first paragraph as not meeting the written description requirement.

Claim 8 stands rejected as failing to meet the statutory written description requirement. Claim 8 states "The device according to claim 1, further comprising means for removing in an axial direction the gas supplied to the space between magnetron faces and the rotating drum." The Examiner states "removal of gas only in an axial direction is not sufficiently disclosed, only removal in an axial direction and between gaps is disclosed". Applicant refers to paragraph [0021] of the substitute specification which states "According to Fig. 2, the gas supply lines 8 (e.g. gas tubes comprising each a line of gas supply apertures) are arranged between each two magnetron faces and the gas is removed mainly along the length of the outermost magnetron faces in tangential direction and in axial direction. It is possible also to leave e.g. every second gap between two neighbouring magnetron faces without a gas supply line such that the gas is removed through these gaps also." Applicant also refers to claim 8 as originally filed which read "The device according to claim 1, wherein gas supplied to the space between magnetron faces and the supporting and transporting means is allowed to be removed in an axial direction and/or between adjacent magnetron faces." Applicant believes this is sufficient disclosure to support the claim in its current form.

Applicant concludes that the section 112, first paragraph rejections of the cited claims should be reversed because the invention as claimed is sufficiently

supported by disclosure within the specification and drawings. Specifically the rejection of claim 8 as not meeting the written description requirement is in error.

2. The Rejection of Claims 1 and 7-12 under 35 U.S.C. § 103(a) as being unpatentable under 35 U.S.C. §103(a) over U.S. Patent No.5,879,519 to Seeser et al. (hereinafter Seeser) in view of U.S. Patent No. 3,884,787 to Kuehnle (hereinafter Kuehnle) and U.S. Patent 6,306,265 to Fu et al. (hereinafter Fu)

In order to establish a prima facie case of obviousness under 35 U.S.C. §103, the cited references must teach each and every claim limitation or elements of the rejected claims. *In re Royka,* 490 F.2d 981, 180 USPQ 580 (CCPA 1974). The rejection of independent claim 1 and dependent claims 7-12 is in error and should be reversed, because each and every limitation of the claimed invention is not taught or suggested by the combination of Seeser, Kuehnle and Fu.

The Seeser reference does not teach that for which it has been cited. The Examiner has misinterpreted parts of the Seeser reference, namely: 1) that Seeser teaches a *single step process* with one baffle-free combined process space, when Seeser in fact only teaches multiple step processes; 2) that Seeser teaches *magnetron faces and gas supply lines arranged side by side* to form a combined process space with a part of the circumferential surface of a drum, when in fact Seeser does not teach this; and 3) that Seeser teaches that all *gas supply lines are connected to a source of only one process gas* mixture, when in fact, Seeser does not teach this. Applicant believes the Examiner has used hindsight, in view of Applicant's invention to interpret the figures of Seeser, instead of relying on the Specification of Seeser and the state of the art at the time of the Seeser patent.

1) Single Step Process - One Baffle-Free combined process space

Seeser teaches only a multiple step coating process by means of reactive sputtering, meaning that in a first step, a material is deposited onto the film, and in a second step this material is brought to a chemical reaction, in particular oxidation. No matter how many layers of material are added to the film, each layer of material is subject to the second chemical reaction step. The disclosure of Seeser can be difficult to navigate, because so many embodiments are disclosed, but all embodiments of Seeser comprise multiple step processes. This is evidenced by the fact that Seeser does not teach or suggest a baffle free combined process space. Instead, each step of Seeser is performed in a separate process space.

Referring to the text of Seeser, the Abstract states:

> A thin film coating system incorporates separate, separately-controlled deposition and reaction zones for depositing materials such as refractory metals and forming oxides and other compounds and alloys of such materials. The associated process involves rotating or translating workpieces past the differentially pumped, *atmospherically separated, sequentially or simultaneously operated deposition and reaction zones*...

Further, the "Summary of the Invention" portion of Seeser's specification first describes "Characteristics of Deposition and Reaction Zones". This summary section describes how the deposition and reaction zones are physically separate. Further, in the summary section of Seeser, a "Present System and Method of Operation" is described in a way such that the substrate moves past a set of processing stations and describes "the chemical reaction devices and "the deposition devices", meaning that both are always present.

Thus, in Seeser, there are always separate reaction zones and deposition zones.

Evidencing this in greater detail is the disclosure of Seeser, again from the Summary of the Invention portion of the specification. Seeser states at col. 2, lines 56-60:

> the reaction is effected by means of a highly intense plasma in a highly efficient manner at high gas pressures in a long narrow zone, isolated physically from the metal deposition zone by a region of relatively low pressure.

Also column 4, lines 6-8 states:

"long narrow zones for both deposition and reaction with complete physical separation of the zone boundaries"

Column 4, lines 8-14 mention that metal deposition is made at relatively low pressure, while reaction is made at high pressure.

All of these statements point to one conclusion, that Seeser does not teach one combined process space. Rather, physical isolation between the deposition and reaction zones is a mandatory feature of the Seeser invention and present in all embodiments, even if not specifically shown in detail in all of the Figures.

No part of Seeser, including Figs. 15 and 16 cited by the Examiner, teach one baffle-free combined space, as required by the claims. Rather "physical separation" or "pressure separation" in the context of the Seeser disclosure requires that baffles confine at least the active zone of either the deposition device or the reaction device in Seeser.

This fact is illustrated by reviewing the specific embodiments disclosed by Seeser.

Figs. 4 and 5 show a DC magnetron sputtering device 30 that can be used as a deposition station 26, 27 or reaction station 28, e.g. in an embodiment as shown in Figs. 1-3. This device 30 comprises a housing which forms a gas baffle 32. “The

baffles 32 in the individual sputter devices 30 effectively divide the overall processing chamber 10, in Figs. 1 and 2, into different regions or sub-chambers at each sputterer in which different gas atmospheres and/or gas partial pressures can be established" (col. 7, l. 62-66). Also, other parts of the description of Figs. 4 and 5 refer to "baffle-separated magnetron cathodes" (col. 8, l.18-28).

Figs. 6 and 7 of Seeser show an inverse linear magnetron-type of ion source 40 which can be used as a reaction station 28. This device also has baffles 32 as shown in Figs. 4 and 5. For clarity reasons, these are not shown in Figs. 6 and 7, as explicitly stated in col. 8, l. 49-50 of Seeser. A narrow, localized reaction zone is thus established (col. 9, l. 47-49).

Figs. 32-35 of Seeser show further embodiments of the deposition device that are not magnetrons. Here again, the space in front of the ion source is baffled (reference numerals 203, 223).

Baffles are also shown in most of the figures of Seeser that depict the whole coating setup, e.g. in Figs. 1, 2, 8, 9, 15, 22, 28, 32-36, 38. In particular, in Fig. 15, all devices 26-28 are baffled, and the respective deposition and reaction zones are confined to the area between each element 26-28 and the surface of the drum. There is no combined process space for all devices 26-28 in Fig. 15 of Seeser, but the process spaces are physically separated from one another.

Applicant disagrees with the Examiner's contention that, referring to Fig. 15 of Seeser, because a baffle does not completely enclose a station (leaving an open space between the station and film surface) that this teaches a baffle-free combined process space according to claim 1.

The other figures that do not show baffles either do not show the deposition/reaction devices at all or show these devices only purely schematically.

However, as discussed above, the baffles must be there for proper function, even if not explicitly shown. One of ordinary skill in the art learns from the description (in particular col. 8, l.3-13) that, independent of the type of station used, it is mandatory to enclose the deposition device and the reaction device in distinct partial pressure regimes or chamber regions. Any omission of the baffles is just to simplify the drawings.

In particular, Fig. 16 illustrates only an alternative in the drive mechanism of the web, i.e. the film supply, idler and feed rollers, drum and supply reel. This is why the details of the magnetrons (stations 26-28), that have been explained in other parts of the description of Seeser, are not repeated in connection with Fig. 16. Only the position of the stations 26-28 is indicated with the boxes in Fig. 16 (according to col. 7, l. 19-20, the reference numerals 26-28 do not necessarily indicate the device as such but may also refer only to the station, i.e. the intended position of the device).

Thus, interpreting Seeser in view of all of its disclosure, the reference fails to teach or suggest a baffle-free combined process space as required. Kuehnle and Fu fail to cure this deficiency in Seeser.

2) Magnetron Faces and Gas Supply Lines Arranged Side by Side

In Seeser, the stations 26-28 are at a distance from one another, as required for the multiple-step process and the physical separation of the deposition and the reaction zones. See for example Figs. 1, 2, 8, 9, 10, 11, 12, 14-16 of Seeser, where there is a distance between the stations 26-28 that exceeds the width of the respective station by far.

Seeser does not show that the magnetron faces and the gas supply lines are arranged **side by side**, to form a quasi continuous surface confining one common process space, as required by the claims.

Kuehnle and Fu fail to cure this deficiency in Seeser.

3) *All Gas Supply Lines are Connected to a Source of Only One Process Gas*

As discussed above, Seeser discloses an at least two-step process only. Apart from the physical separation of the reaction and deposition zones, this implies that at least two different stations 26-28 and more than one process gas are used, i.e. one process gas for depositing a material, and the other one for the subsequent chemical reaction (normally oxidation).

In Figs. 15 and 16 of Seeser referenced by the Examiner, no details of the gas supply are shown. Not even a gas supply itself is shown. This is not surprising, because these figures show only an alternative of the drive mechanism, and the other parts of the system have been explained before. There is also no description of the gas supply in connection with Figs. 15 and 16.

It is not correct that Fig. 16 indicates that any one of the stations 26-28 can be used in all stations, as stated by the Examiner. Fig. 16 is a simplified drawing of only the drive mechanism. Reference numerals 26-28 indicate only positions of the deposition/reaction devices. It does not mean that there can be three identical stations 26, or three identical stations 27 or three identical stations 28, but that the order of the stations 26-28 along the circumference of the drum can be chosen according to the actual requirements. The same applies to Figs. 10, 11, 14, 28 of Seeser, for example, where also the mechanics are shown and details of the stations 26-28 are omitted.

Therefore, Fig. 16 cannot be interpreted in such a way that one and the same type of station is used threefold. The device shown is still for a multiple-step process, meaning that the stations 26-28 are operated differently and that different gases have to be supplied to these stations.

Thus, Seeser does not disclose the claim limitation that **all gas supply lines are connected to a source of only one process gas mixture**.

Kuehnle and Fu fail to cure this deficiency in Seeser.

Additionally, Seeser does not teach or suggest that each magnetron has its own power supply unit. Fig. 37A shows **purely schematically** only one magnetron 40A without showing the whole setup with several magnetrons. A power supply unit 241 connected to the magnetron 40A is shown. There is no disclosure how the whole system comprising several magnetrons looks like. Consequently, Seeser does not disclose that each magnetron has its **own power supply unit**.

Kuehnle and Fu fail to cure this deficiency in Seeser.

As the proposed combination of references does note teach each and every claim limitation or element of the rejected claim, it is considered apparent that a prima face case of obviousness has not been established for claims 1 and 7-12 and the Examiner's rejection is in error.

Conclusion

The prior art rejections of the cited claims should be reversed because the cited references either do not disclose the invention fully or are not properly combinable.

For the reasons set for the herein, the rejections of the claims 14-28 of the present application are in error and must be reversed.

Respectfully submitted,

Rankin, Hill, Porter & Clark LLP

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/James A. Balazs/
James A. Balazs
Reg. No. 47,401

VII. CLAIMS APPENDIX

1. (Previously Presented) A device for coating a web material in a single step plasma enhanced chemical vapor deposition process, the device comprising:

a vacuum chamber (1) equipped for maintaining a constant reduced pressure therein and,

arranged within the vacuum chamber (1) are,

a rotating drum for supporting and continuously transporting a web material lying against a circumferential surface of the drum, the drum being one of electrically grounded, electrically floating, and negatively biased,

more than two independent, substantially identical, magnetron electrodes (6) comprising:

rectangular magnetron faces with a length and a width,

a center pole and a peripheral pole, the two poles having opposite polarities and the peripheral pole extending around the center pole, and

each magnetron electrode (6) being powered with an alternating voltage by its own power supply unit (7), and

a plurality of gas supply lines,

wherein the magnetron electrodes are arranged with the magnetron faces facing the circumferential surface of the drum and at a same distance therefrom, the lengths of the magnetron faces extending parallel to a drum axis and the widths of the magnetron faces extending substantially tangential to the circumferential surface, and

wherein the gas supply lines extend between neighboring magnetron electrodes and comprise rows of gas outlets arranged for gas injection substantially perpendicular to the circumferential drum surface, wherein the magnetron faces and the gas supply lines are arranged side by side to form, together with a part of the circumferential surface of the rotating drum, one baffle-free combined process space and wherein the gas supply lines are connected to a source of only one process gas mixture.

7. (Previously Presented) The device according to claim 1, wherein the magnetron electrode (6) constitutes a twin magnetron.

8. (Previously Presented) The device according to claim 1, further comprising means for removing in an axial direction the gas supplied to the space (10) between magnetron faces and the rotating drum .

9. (Previously Presented) The device according to claim 1, wherein the magnetron faces comprise electrode pieces (34) of a non magnetic material extending over the magnetic poles constituting the magnetron face.

10. (Previously Presented) The device according to claim 9, wherein the electrode pieces (34) of the magnetron faces comprise channels (35) for receiving a cooling medium.

11. (Previously Presented) The device according to claim 1, wherein the magnetron electrodes (6) constitute magnetrons of an unbalanced type.

12. (Previously Presented) The device according to claim 11, wherein the magnetron faces comprise permanent magnetic central and peripheral poles (30 and 31), the central pole (30) having a magnetic strength that is about half of a magnetic strength of the peripheral pole (31).

IX. EVIDENCE APPENDIX (none)

X. RELATED PROCEEDINGS APPENDIX (none)